Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

Proposal to directly observe the Kondo effect through enhanced photo-induced scattering of cold fermionic and bosonic atoms BHUVANESH SUNDAR, ERICH MUELLER, Cornell University — We propose an experimental protocol to directly observe the Kondo effect by scattering ultracold atoms with spin-dependent interactions. The Kondo effect is a transport anomaly which occurs when conduction electrons interact with magnetic impurities. We consider an ultracold system consisting of a gas of fermionic ^{6}Li atoms and a gas of bosonic ^{87}Rb atoms, where ^{6}Li atoms play the role of conduction electrons and ^{87}Rb atoms play the role of magnetic impurities. We propose a method to engineer Kondo-like interactions between them. To measure the Kondo effect, we imagine launching the ^{87}Rb gas into the ^{6}Li gas, and calculate the momentum transferred to the ^{6}Li gas. We show that the temperature dependence of this momentum is logarithmic at low temperatures and has a minimum, characteristic of the Kondo effect and analogous to the behavior of electrical resistance of magnetic alloys. Experimental implementation of our proposal will give a new perspective on an iconic problem.

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Date submitted: 29 Jan 2015 Electronic form version 1.4